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POLISH COAL INSTITUTE AIDS
COAL AND CHEMICAL INDUSTRIES

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Since the organization of the Coal Institute in April 1945, five annual reports have been published in which the achievements of the Research Laboratories of the Coal Institute were enumerated. The annual reports of the coal industry also covered the institute's activities.

Przegląd Gorniczy has reported the operations of the Coal Institute six times in 5 years. The March 1945 issue published the statute and defined the tasks, privileges, and responsibilities of the institute. The January 1946 issue enumerated the achievements of the institute in its first year, reviewed its plans for the future, and listed the members of the Scientific Council and Exact Science Committees. Two short reports of the activities of the institute were published in the January/February and July/August 1947 issues. The May/June 1948 issue was devoted entirely to the work of the institute. Its organization was explained in detail and 3 years' achievements enumerated. A short resume of actual problems solved was also given. An article in the May 1949 issue showed the changes caused by the separation of the institute from the CZPW (Central Office of the Coal Industry), placing it directly under the Ministry of Industry and Trade, and the changes resulting from the transformation of the Coal Institute into the GIPN (Main Institute of Natural Fuels) composed of the Coal, Petroleum, and Peat Institutes. The article also gave the newly appointed members of the Scientific Council and the Exact Science Committees whose main task was to review and approve the 6-year GIPN research plan.

In addition to the reports listed above, the Coal Institute published the developments of research and original projects developed in its own workshops in Biuletyn Instytutu.

To date, 65 such reports, and several score books and handbooks of instruction have been published. The personnel of the institute have also published many articles on coal mining and mining technology in the trade journals, especially Przegląd Gorniczy.

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Courses and lectures were given by the institute for laboratory workers, technicians, and supervisory personnel of the industry. The institute opened a library for the coal industry with well-organized technical documentation. The institute also publishes Przegląd Bibliograficzny Gornictwa.

The Coal Institute was organized to assist the coal industry in solving actual problems. Its most essential work is its cooperation with the coal industry to provide constant scientific control over technical processes and production.

The Scientific Council, composed of professors of higher schools, specialists in science and technology, and prominent workers in the industry, is appointed by the Minister to direct the research and scientific work of the institute. Close cooperation between the institute and the coal industry was assured by the appointment of the chief technical director of the CZPW as chairman of the Scientific Council for the five years of its existence; directors of the various CZPW divisions were appointed directors of the corresponding research centers.

The committees of the individual research centers met once every 3 months. Every 6 months a report of the work completed and proposed plans for the next 6 months were submitted at the plenary meeting of the council.

Representatives of the interested ministries attended the meetings of the scientific committees of the council to assist in directing the work of the Coal Institute according to the basic principles of the over-all national plan.

At present, the Institute has six research laboratories, a board of directors, and a total employment of 680 persons. The scientific laboratories have workshops in 16 stations near the mines and coke plants of Gorný Slask and Dolny Slask, for lack of available locations in Katowice.

The Coal Institute is composed of the following research laboratories:

I. Zaklad Gorniczy (Mining Research Center) in Katowice, with an experimental section in the Miechowice Mine, a ventilation and fire-prevention section in Bytom, an experimental station in the Mars Mine, seismic stations at the Rozmark Mine and in Zabrze, and a geological department for Dolny Slask in Solice.

II. Kopalnia Doswiadczalna Barbara (Barbara Experimental Mine) in Mikolow, working on explosives and on the prevention of coal dust and methane explosions.

III. Zaklad Mechanizacji Gorniczej (Research Center of Mine Mechanization) in Katowice, with a Research and Mining Machine Service Center in Zabrze.

IV. Zaklad Mechanicznej Przerobki i Petrografii (Research Center for Mechanical Processing and Petrography) in Katowice and in Welnowiec, with a laboratory at the Polska Mine in Swietochlowice.

V. Zaklad Chemicznej Przerobki (Research Center for Chemical Processing) in Biskupice with a branch in Walorzach for the Dolny Slask area, a department for brown coal in Wroclaw, and a section for the processing of sapropelic formations.

VI. Zaklad Medycyny i Psychologii Pracy (Research Center for Industrial Medicine and Psychology) in Katowice, with a branch in Zabrze (in connection with the Social Insurance Hospital) for research in silicosis, a sub-branch in the hospital in Katowice for research in silicosis, a department for medical experts and research in Zabrze at the miners' hospital, specializing in the organs of locomotion, a temporary silicosis diagnostic station in Walbrzych, and a mobile X-ray microphotography group.

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In 1945, several score of surveys were made for the coal industry and five scientific works were published. In the following years, the number of works increased in proportion to the increase in the number of research stations and personnel. In 1946, 184 surveys and 39 scientific research works were completed; in 1947 - 300 surveys and 90 scientific works; in 1948 - 415 surveys and 116 scientific research works; in 1949 - 682 surveys and 281 scientific research works. The number of analyses completed increased from 18,000 in 1945 to 130,000 in 1949; in addition, Research Center VI completed many thousands of medical and psychotechnical surveys and reports.

The documentation branch published Przegląd Bibliograficzny Gornictwa, 624 reviews from foreign and Polish periodicals, catalogued 2,500 cards pertaining to Polish mining literature since 1934, and made 48 translations from foreign periodicals.

The division of standards which originally was subject directly to the CZPW, in this 5-year period, completed 211 pages of proposed standard specifications published in the Przegląd Gorniczy, 51 final specifications (75 pages), and published 28 reports on standard specifications.

The library of the Coal Institute has 8,568 volumes and receives 156 foreign and Polish periodicals.

Some of the early problems of the coal industry after its reactivation in 1945 were to protect the miners from the dangers of coal dust and methane explosions and to improve the quality of coal and coke. In the 5-year period, Research Center II inspected the coal seams and classified them according to the degree of hazard. New types of electrical equipment were systematically tested for safety of operation in air permeated with methane.

Research Center IV was responsible for improving the quality of coal extracted by systematic and supervised inspection of the coal shipped, by checking mechanical sorting and washing operations, by improving the equipment or adapting it to the variable properties of the coal extracted from the various seams and by working out plans for the production plants.

Research Center V improved coke by systematic inspection of the coal used in coke production and by inspection of the final product. Mixtures combining several grades of coal from Gorny Slask and Dolny Slask to improve the quality of coke and permit a more economical use of the meager reserves of coking coal were developed.

By petrographic and chemical research on certain strata or seams which extend through the entire Gorny Slask Basin, Research Center IV proved that this type of coal can be found only under conditions of great tectonic pressure. In this manner the area in which this coal can be found and on which prospecting should be done was localized.

When the re-emigration of Poles from France and Belgium began, silicosis of the lungs and the danger of nematodiasis became a problem. Research on a large scale was immediately started by Research Center VI. The results helped to decrease the number of silicosis sufferers and to give sufferers proper employment. Experiments showed that the fear of spreading nematodiasis was groundless.

The coal industry took over the mines and equipment in a very damaged condition and in time imported new equipment from abroad, simultaneously increasing domestic production of mining machinery. Many surveys were made on the proper use of mechanical and electrical equipment in the coal mines, on the suitability of foreign equipment and its maintenance, and on the evaluation of machinery of domestic production. Production was started on a new type of slotted screen which had been developed, a new type of mechanized miner's hammer, and a new type of coal cutter. Industry and the institute cooperated in the development and testing of new electromagnetic equipment for testing cables.

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Much work was done on lubrication, which had been a very difficult problem in the coal industry. For purifying water in boilers, Research Center V developed and started production of its own patented "Escarbo" to take the place of the imported product.

With increased extraction of brown coal, chemical processes not heretofore known in Poland became important. A pilot plant was activated for the production of montan wax. The organization of the production of plastics is nearing completion.

Increasing imports of petroleum products posed the problem of increasing the production of liquid fuel. Liquid fuel and oil can be secured from sapropelic formations. Research Center I carried out prospecting for sapropelic shales and estimated the reserves. Research Center V analyzed samples and developed a processing method. A few test drillings will be made in 1950 to determine the best place to start extraction.

With the increasing demand for liquid fuel, it became necessary to expand facilities for deoxidizing open burning coal, but then the small demand for semicoke became a problem. Research Center V developed a method of utilizing certain varieties of semicoke in combustion engines on tugs, and experimental use in cement and zinc works has given favorable results.

Because of the increasing demand for sulfur, research was done on the utilization of pyrite recovered in the processing of coal. Research Center IV tested many types of coal from various mines and deposits, found that several types were adaptable to such production, and developed a process.

Research Center I prospected for fire-clay shales near coal strata and made analyses. The amount of coal lost in the process of extraction was also investigated by this center. Practical application of the result of this research at the mines will reduce losses.

Research Center I recorded and evaluated the various methods of coal mine operation resulting from the rapid development of Polish coal mining since 1945. As coal extraction increased, the economic significance of the increasing volume of coal dust came to the fore. Research Center I studied extraction and blasting methods to reduce coal dust and methods of storing coal dust.

Advancing mechanization in mining made it imperative for Research Center VI to study occupational diseases, especially those resulting from the use of impact tools. This research will lead to improvements in tools of the future. With the development of specialization, the center also determined psychotechnical requirements for certain kinds of specialization.

As work competition initiated by the coal industry expanded, Research Center I developed time studies and teamwork organization charts, and studied the methods and results of leading shockworkers. Time-study experts have been trained to further work competition and disseminate improved methods developed by shockworkers. All research centers tested and evaluated workers' suggestions and gave advice to innovators.

The increased use of waterways in coal export has made it necessary to investigate the spontaneous combustion of coal. Research Centers I and V worked out a laboratory method of testing coal for spontaneous combustion to aid the Central Coal Marketing Office in selecting types of coal adaptable to transportation over long distances. Research Centers IV and V worked out a plan for classifying coal and submitted it to an international forum.

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The above resume of the activities of the Coal Institute is not exhaustive. Mention should be made, however, of its continuous research on mining explosives, cleavages in coal veins, phenomena of tamping and shock, underground gassification of coal, underground fires, settling of the ground in undermined areas, selection of protective pillars, properties of ashes from Polish coal, classification and nomenclature of the petrographic elements of coal, and recovery of gases for polymerization into liquid fuels.

Courses organized and conducted by the Coal Institute in cooperation with the Central Coal Administration or the Central Bureau of Vocational Training in the past 5 years included: courses for laboratory assistants, explosive technicians, ventilation experts, safety technicians, time-study technicians, industrial physicians, and medical attendants and maintenance personnel for the newly installed mining machinery. The Center for Testing and Servicing Mining Machinery was recently activated in Zabrze.

The staff of the institute may seem large to those who do not understand the problems of the coal industry. Actually, the institute has felt a shortage of highly specialized personnel to direct and train assistants who lacked experience in scientific research. Because of the severe shortage of mining engineers, Research Center I makes use of the personnel of the coal industry and professors of the educational institutions, using them on the following committees of experts:

1. Pressure and tamping
2. System of selecting deposits
3. Transport
4. Mine fillers
5. Work norms
6. Dimensions and ventilation
7. Mine surveying and estimate of damage from undermining
8. Yield from mines

The Six-Year Plan for Research, which, after a few changes, was accepted by the Scientific Council and approved by superior authority, places entire responsibility on the Coal Institute. The main objectives of the Six-Year Plan are: cooperation with the enterprises of the coal industry in difficult problems; raising coal extraction; improving labor productivity by the introduction of new methods to facilitate the miner's work; and protecting the miner from serious accidents.

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